

odd instances of Richard's Pipit *Anthus novaeseelandiae* and Plain-backed Pipit *A. leucophrys* being used by other cuckoo species (Friedmann 1948).

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SOME OBSERVATIONS ON A CAPTIVE GREY HORNBILL *TOCKUS NASUTUS*

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On the morning of 5 April 1973 a fledgling female Grey Hornbill was found below a nest hole, the entrance of which had been resealed by her two siblings. The nest, which was in an aluvial cliff at Magadi, Kenya, had originally been excavated by Red and Yellow Barbets *Trachyphonus erythrocephalus* before being taken over by the hornbills for use in 1971, 1972 and 1973.

The fledgling, which was barely able to fly, was captured, taken to Karen and given the freedom of a large glassed-in verandah where she lived until killed by a cat two years later. Observations made during this period revealed a number of interesting hornbill attributes, apparently undescribed previously

PELLET REGURGITATION At first the hornbill was given a diet of mealworms and grasshoppers, supplemented with fruit. I usually offered food by hand, generally giving the bird her first meal at 07.00 hrs. One morning, when she was two months old, the bird showed no interest in eating a grasshopper which I then pushed into her gullet. This appeared to distress her and was followed by ejection of the grasshopper together with a bright red pellet, some 20 mm x 10 mm. After regurgitating the pellet, further grasshoppers were readily accepted.

A search of the verandah revealed a small heap of pellets lying on a high shelf used for roosting. Daily observations during the following months showed that a pellet was ejected each morning prior to the first meal. Analysis of the pellets showed them to consist of hard chitinous insect portions, mostly grasshopper femora. As the bird became older she was given far fewer insects and pellet production stopped.

LATERAL SCISSOR-LIKE ACTION OF THE BEAK Few birds, apart from crossbills *Loxia* spp., appear able to displace the maxilla to either side of the midline and to use this lateral movement in feeding. I found that the hornbill could move the tip of the maxilla laterally some 4 - 5 mm across the mandible. When dealing with a large grasshopper she held the insect head first, and then adjusted its position until she could snip through the femur of first one hind leg and then its opposite number, with lateral scissor-like movements of the extreme tip of the beak.

PROTECTION OF THE EYES DURING FEEDING Any bird feeding on large grasshoppers such as *Ornithacris*, is exposed to the risk of having its eyes seriously damaged by threshing movements of the hind legs, whose femora are powerfully muscled and whose tibiae bear two rows of sharp spines. Screeing of the eye(s) by the nictitating membrane(s) in such circumstances is usual in many bird species. The hornbill was no exception, and regularly protected her eyes in this way while 'mandibulating' large grasshoppers into position for cutting off the hind legs.

MOVEMENT OF THE 'UNDER HAND COVERTS' ON THE UNDERWING A feather tract lying adjacent to the alula and over the carpal joint has been called the 'tetrices minores and marginales of the manus' (Wray 1887), and also the 'under marginal and minor primary coverts of the hand' (Lucas & Stettenheim 1972). In my Grey

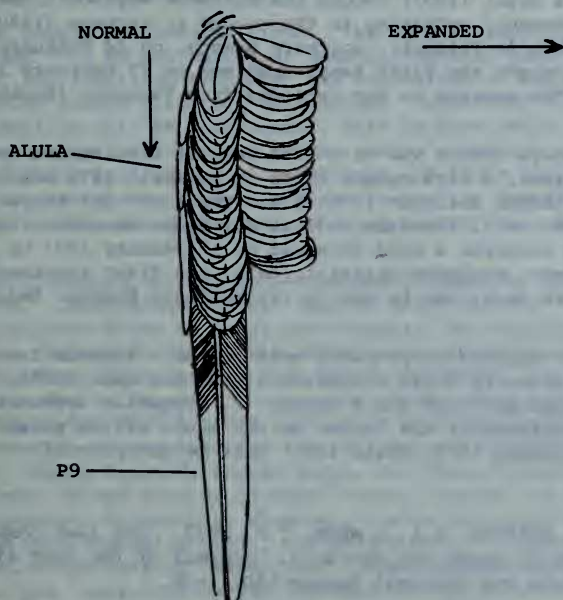


Fig. 1

Hornbill this tract consisted of a double row of 36 small white feathers, each about 20 mm long. Usually these feathers were held with their apices pointing downwards in an almost hidden position under the wing margin, but when 'bored', fully fed, or apparently cold, the hornbill was repeatedly seen to spread these feathers horizontally (Fig.1) until they almost met across the breast, while she sat in a hunched position with head lowered into and between the shoulders. I think that these movements indicate an interesting and complicated musculature which would repay investigation. An alternative suggestion that the wings were deformed or the alulae damaged was not supported by a close examination of the wings (one still preserved) after the bird's death.

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